VII. COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

The FFC is willing to comply with the Standard Terms and Conditions.

Pursuant to CALFED Standard Clauses and Proposal Requirements for a non-profit conducting services and preconstruction, attached are:

Item 7: Non Discrimination Compliance Statement

Item 10: Non-Collusion Affidavit
(Note: this is included per instructions although we are not bidding on a public works contract)

Also attached pursuant to Item 4: Contract Requirements, under the Fish Passage and Related Screen Improvements Topic is Form DI-2010.

Rancho Murieta Community Services District

15160 Jackson Road • P.O. Box 1050 • Rancho Murieta, CA 95683 • (916) 354-3700 • FAX (916) 354-2082

July 1, 1998

Mr. Trevor Kennedy
Fishery Foundation of California
P.O. Box 271114
Concord, CA 94527

Subject: Fish Ladder Improvements at Granlee's Dam

Dear Mr. Kennedy:

Thank you for a copy of your draft proposal to CALFED requesting funding of fish barrier improvements along the Cosumnes River. It helps to clarify the projects you envision on the river, particularly your suggestions for improvements to the existing fish ladders at Granlee's dam, which we have discussed on numerous occasions.

The fish ladders are part of the diversion facilities owned and operated by the Cosumnes Irrigation Association (CIA). The District is part owner of the CIA along with other property owners served by the diversion facilities. As such, the CIA, not the District, is the true entity to approve your suggested fish ladder improvements.

The CIA and the District's Board were apprised of your proposal. Both are reviewing the proposal and you can expect a response in the not too distant future.

Please call if you have any questions.

Sincerely,

Edward R. Crouse
General Manager

Date 6-29-98

Trevor Kennedy
Fishery Foundation of Calif
P.O. Box 271114.
Concord CA 94527

Dear Mr. Kennedy:

We have had several discussions regarding your organization's proposal to improve or remove several fish barriers along the Cosumnes River.

As you know, I own land along a portion of the Cosumnes River where one of the barriers is located. I am interested in your proposal and am willing to cooperate with your work.

When you are ready to proceed with the work, give me a call and we can discuss the details.

Name/Signature
Richard Becker

Gay road
Wilton, CA. 95693
916-687-8527

The Nature Conservancy®

1330 21st Street
Suite 103
Sacramento, California 95814
TEL 916 449-2857
FAX 916 448-3469

Cosumnes River Preserve
13501 Franklin Boulevard
Galt, California 95632

International Headquarters
Arlington, Virginia
TEL 703 841-5300

July 2, 1998

Mr. Lester Snow
Director
CALFED Bay Delta-Program
1416 Ninth Street, Room 1155
Sacramento, California 95814

Dear Mr. Snow:

The Nature Conservancy would like to support the Fishery Foundation of California's application for funds to improve fish passage on the Cosumnes River. The application is titled: **Cosumnes River Salmonid Barrier Program.**

The Cosumnes River historically supported an important fall run of Chinook salmon numbering in the thousands as recently as the 1950's. We believe that the Cosumnes run is restorable since it still retains a natural hydrograph and opportunities for spawning gravel replenishment.

We feel that the Fisheries Foundation is well suited to work in partnership with the Rancho Murieta Community Services District, the Cosumnes Irrigation Association, and other relevant entities to cooperatively solve passage problems on the Cosumnes. This proposal complements work already underway by the University of California at Davis addressing fall attraction flow issues on the Cosumnes. We believe that solutions to both fall flow and passage problems are achievable and will lead to a revived and vital fishery with a direct connection to the eastern Delta. We hope you will seriously consider this proposal for funding.

Sincerely,

Michael R. Eaton
Director
Cosumnes River Project

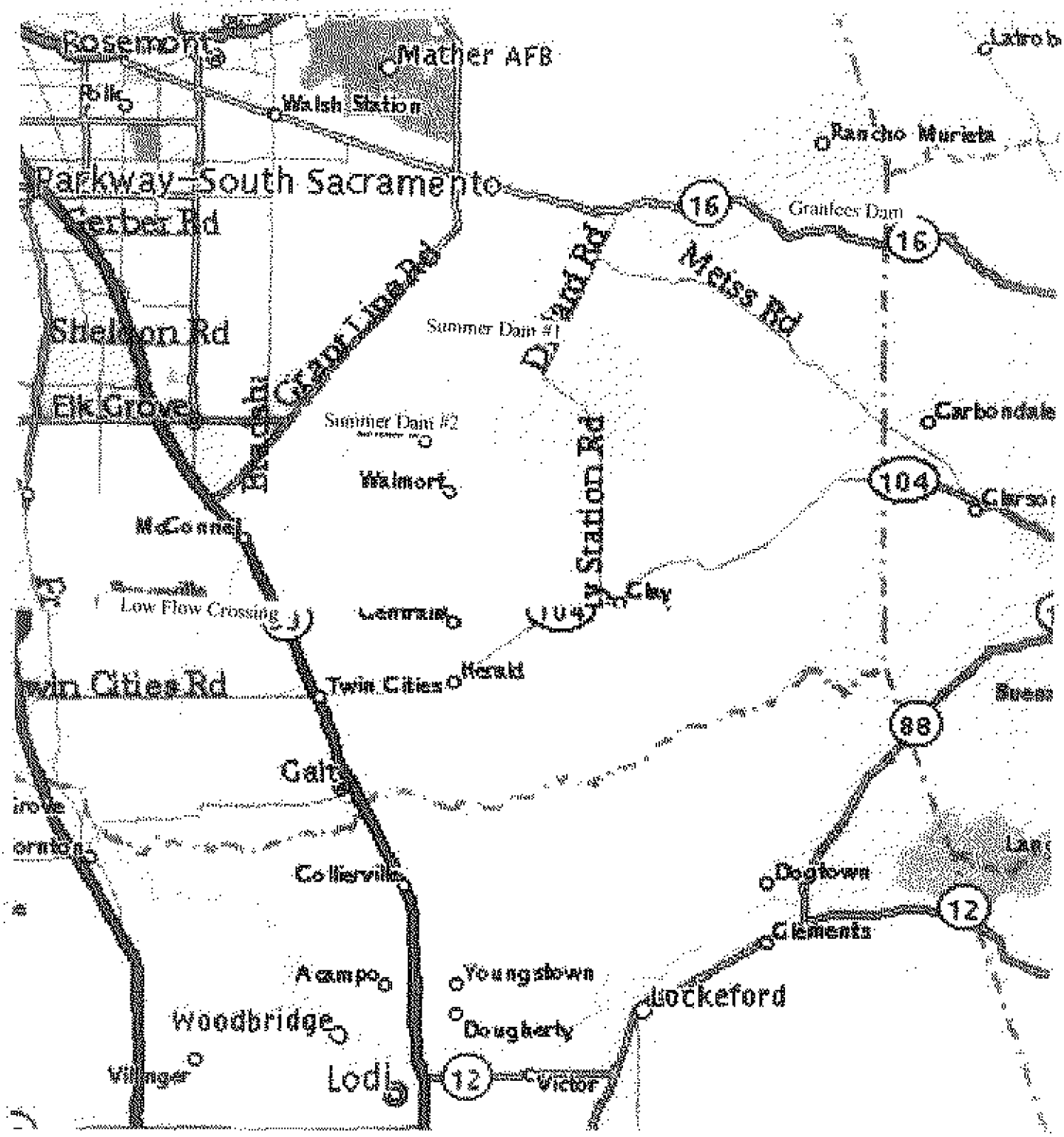

Figure 1. Approximate locations of known salmonid migration barriers on the Cosumnes River, Sacramento county, CA.

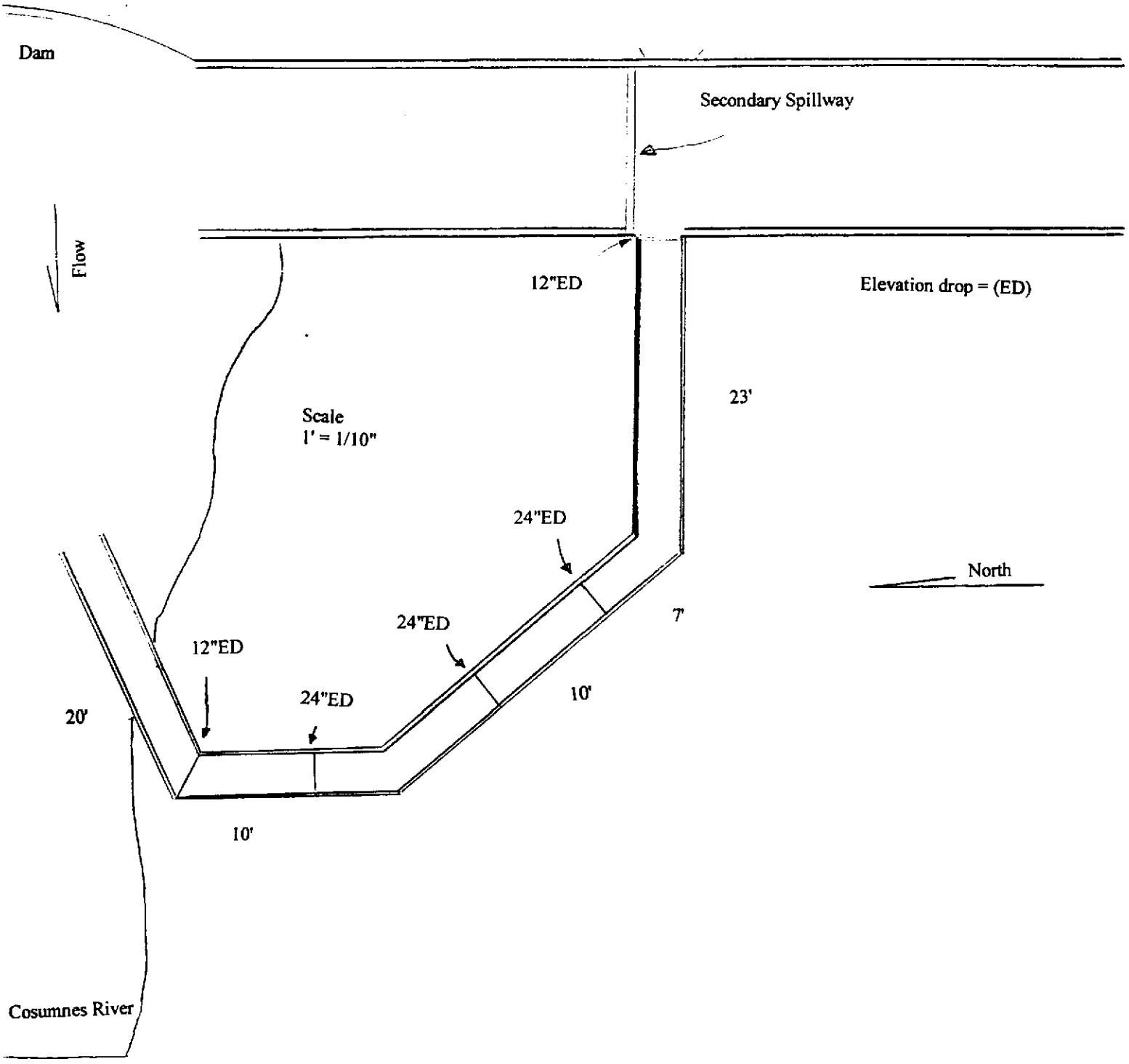

Figure 2a. Existing left bank fish ladder at Granlees Diversion Dam, Rancho Murrieta, CA. Ladder specifications do not meet current NMFS or CDFG hydraulic criteria. Note Excessive elevation drops, inadequate pool widths (w=3'), and small turning pools. Also not the proximity of the exit pool to spillway.

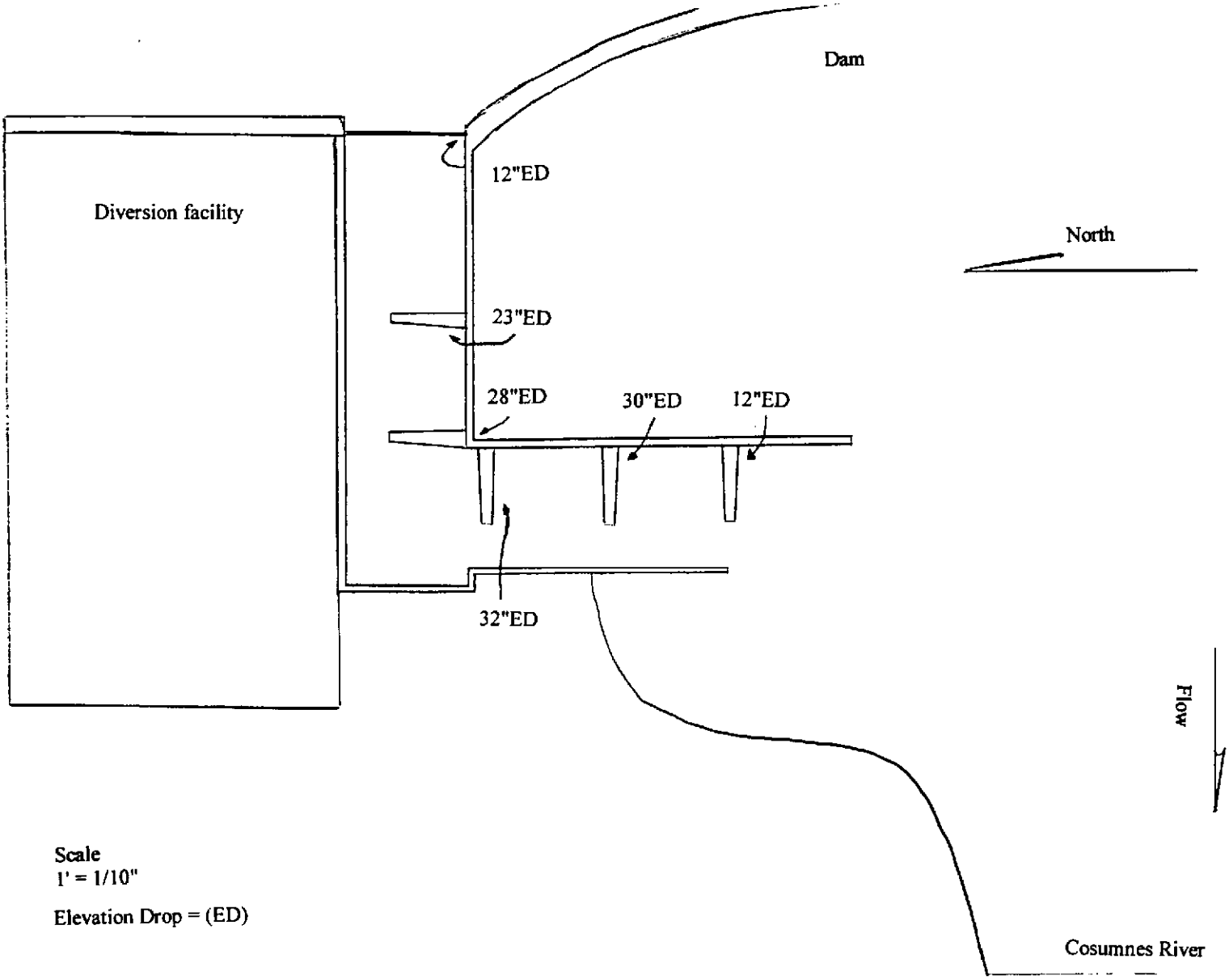

Figure 2b. Existing right bank fish ladder at Granlees Diversion Dam, Rancho Murrieta, CA. Ladder specifications do not meet current NMFS or CDFG hydraulic criteria. Note elevation drops up to three times the maximum suggested jump height of 12 inches. Also note the proximity of the exit pool to the diversion intake.

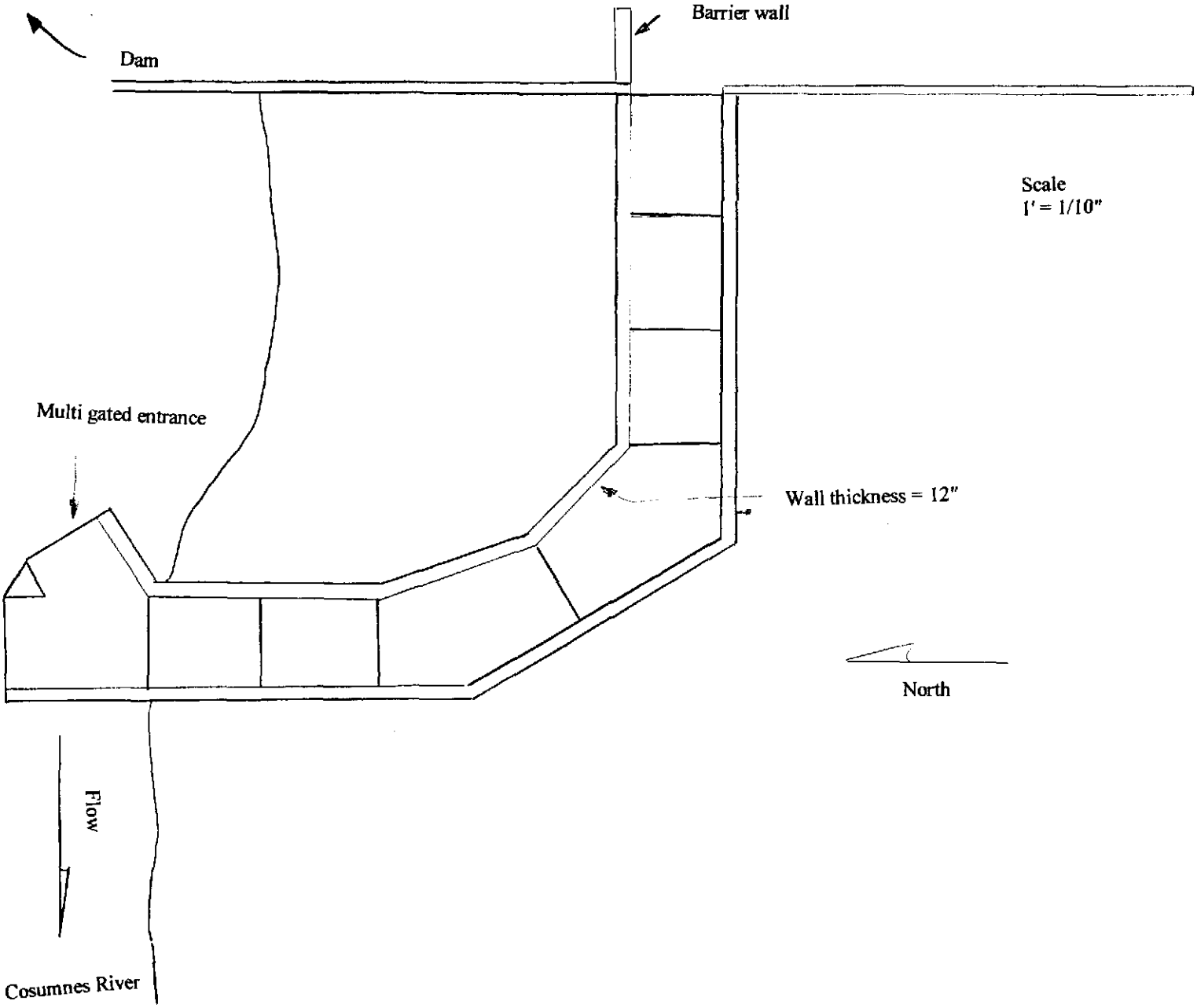

Figure 3a. Conceptual design of modified fish ladder at left bank Granlees Dam, Rancho Murrieta, CA. The new ladder meets or exceeds both NMFS and CDFG hydraulic criteria. Ladder will be lengthened to increase pool numbers and decrease elevation drops to 12 inches in each pool. Depths will be brought up to 4 feet throughout the length of the ladder, widths will be increased to 6 feet to increase volume, and walls will be significantly widened to increase durability throughout a wider range of flows. Note the barrier wall adjacent to the exit pool to prevent fish from spilling back into the basin below the dam upon exiting the ladder. Entrance pool will be outfitted with three entrances for use at different flows.

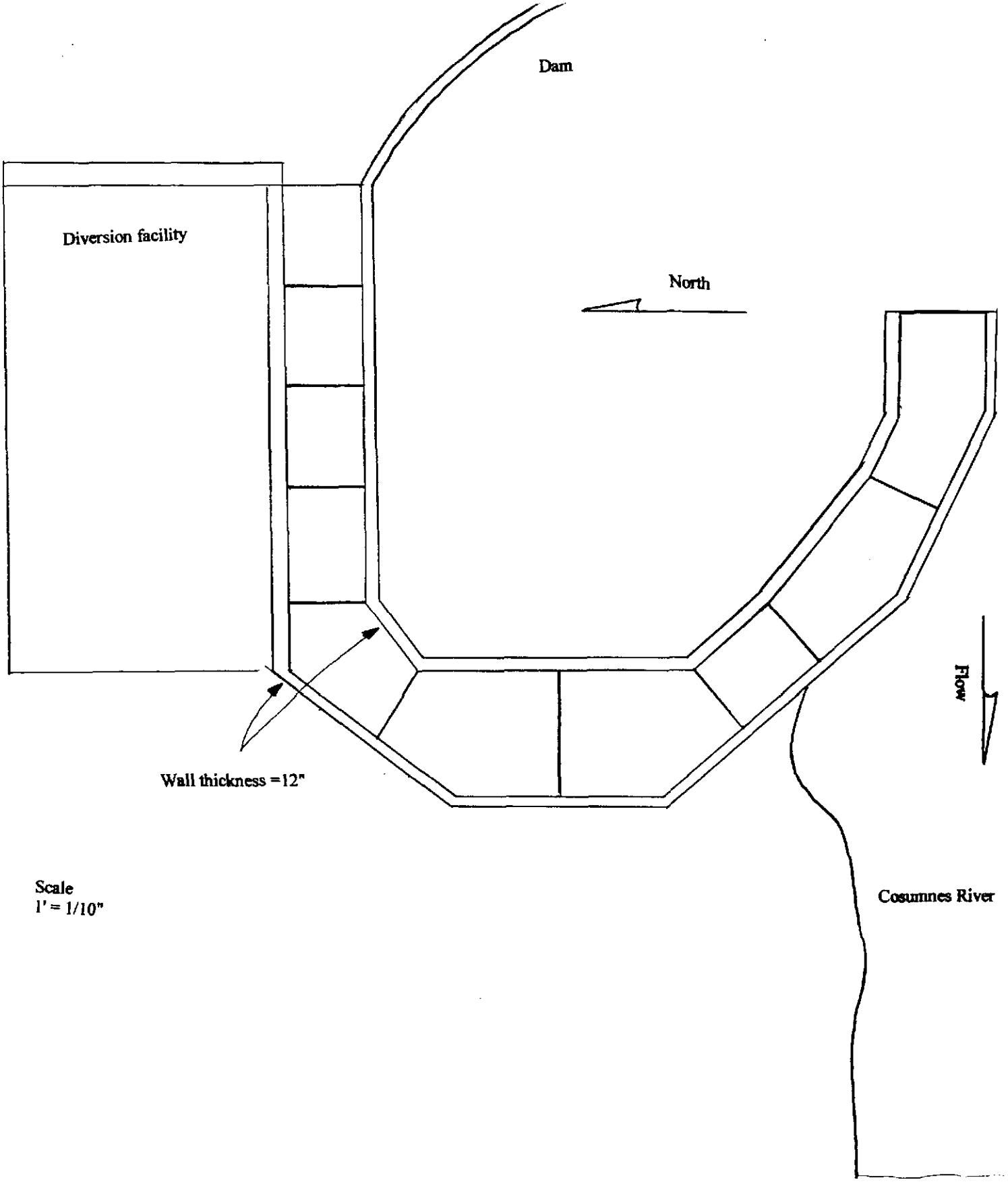

Figure 3b. Conceptual design of modified fish ladder at right bank Granlees Dam, Rancho Murrieta, CA. The number of pools has been increased from 5 to 10 to reduce jump height. New ladder meets or exceeds NMFS and CDFG hydraulic criteria. Elevation drops are less than or equal to 12".

ITEM 7

NONDISCRIMINATION COMPLIANCE STATEMENT

COMPANY NAME

FISHERY FOUNDATION OF CALIFORNIA

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL'S NAME

Patricia E. Duran.

DATE EXECUTED	EXECUTED IN THE COUNTY OF
July 1, 1998	Contra Costa

PROSPECTIVE CONTRACTOR'S SIGNATURE

PROSPECTIVE CONTRACTOR'S TITLE

Executive Director

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

Fishery Foundation of California

ITEM 10

Agreement No. _____

Exhibit _____

NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID FOR PUBLIC WORKS

STATE OF CALIFORNIA)
)ss
COUNTY OF Contra Costa)

Patricia E. Duran (name), being first duly sworn, deposes and says that he or she is Executive Director (position title) of Fishery Foundation of California (the bidder),

the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

DATED: July 1, 1998

By _____
(person signing for bidder)

G PHILLIPS
Commission # 1079311
Notary Public — California
Contra Costa County
My Comm. Expires Dec 3, 1999

(Notarial Seal)

Subscribed and sworn to before me on July 1st 1998

_____
(Notary Public)

U.S. Department of the Interior

Certifications Regarding Debarment, Suspension and Other Responsibility Matters, Drug-Free Workplace Requirements and Lobbying

Persons signing this form should refer to the regulations referenced below for complete instructions:

Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions - The prospective primary participant further agrees by submitting this proposal that it will include the clause titled, "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions. See below for language to be used or use this form for certification and sign. (See Appendix A of Subpart D of 43 CFR Part 12.)

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions - (See Appendix B of Subpart D of 43 CFR Part 12.)

Certification Regarding Drug-Free Workplace Requirements - Alternate I. (Grantees Other Than Individuals) and Alternate II. (Grantees Who are Individuals) - (See Appendix C of Subpart D of 43 CFR Part 12)

Signature on this form provides for compliance with certification requirements under 43 CFR Parts 12 and 18. The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of the Interior determines to award the covered transaction, grant, cooperative agreement or loan.

PART A: Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions

---

CHECK X IF THIS CERTIFICATION IS FOR A PRIMARY COVERED TRANSACTION AND IS APPLICABLE.

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

PART B: Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions

---

CHECK__IF THIS CERTIFICATION IS FOR A LOWER TIER COVERED TRANSACTION AND IS APPLICABLE.

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

PART C: Certification Regarding Drug-Free Workplace Requirements

CHECK X IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS NOT AN INDIVIDUAL.

Alternate I. (Grantees Other Than Individuals)

A. The grantee certifies that it will or continue to provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(b) Establishing an ongoing drug-free awareness program to inform employees about--
(1) The dangers of drug abuse in the workplace;
(2) The grantee's policy of maintaining a drug-free workplace;
(3) Any available drug counseling, rehabilitation, and employee assistance programs; and
(4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will –
(1) Abide by the terms of the statement; and
(2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

(e) Notifying the agency in writing, within ten calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification numbers(s) of each affected grant;

(f) Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted –
(1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
(2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;

(g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a) (b), (c), (d), (e) and (f).

B. The grantee may insert in the space provided below the site(s for the performance of work done in connection with the specific grant:

Place of Performance (Street address, city, county, state, zip code)

_____

_____

_____

Check___if there are workplaces on file that are not identified here.

PART D: Certification Regarding Drug-Free Workplace Requirements

CHECK___IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS AN INDIVIDUAL.

Alternate II. (Grantees Who Are Individuals)

(a) The grantee certifies that, as a condition of the grant, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with the grant;

(b) If convicted of a criminal drug offense resulting from a violation occurring during the conduct of any grant activity, he or she will report the conviction, in writing, within 10 calendar days of the conviction, to the grant officer or other designee, unless the Federal agency designates a central point for the receipt of such notices. When notice is made to such a central point, it shall include the identification number(s) of each affected grant.

PART E: Certification Regarding Lobbying
Certification for Contracts, Grants, Loans, and Cooperative Agreements

CHECK X IF CERTIFICATION IS FOR THE AWARD OF ANY OF THE FOLLOWING AND THE AMOUNT EXCEEDS $100,000: A FEDERAL GRANT OR COOPERATIVE AGREEMENT; SUBCONTRACT, OR SUBGRANT UNDER THE GRANT OR COOPERATIVE AGREEMENT.

CHECK __ IF CERTIFICATION IS FOR THE AWARD OF A FEDERAL LOAN EXCEEDING THE AMOUNT OF $150,000, OR A SUBGRANT OR SUBCONTRACT EXCEEDING $100,000, UNDER THE LOAN.

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

As the authorized certifying official, I hereby certify that the above specified certifications are true.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL

Patricia E. Duran, Executive Director for Fishery Foundation of Calif.

TYPED NAME AND TITLE

DATE July 1, 1998

Evaluation of Salmonid Passage Barriers on the Lower Cosumnes River and Recommendations for Improvements[1]

Prepared by

Delta Fisheries Consultants[2]

Introduction and Background

The Cosumnes River, a tributary to the Sacramento - San Joaquin Delta, provides spawning and juvenile rearing habitat for both fall-run Chinook salmon and steelhead. The Cosumnes River is the only major tributary to the Delta which does not have a major upstream impoundment or water storage facility. As a result, hydrology of the river is highly variable from one year to the next, depending upon precipitation and runoff patterns within the watershed. The lower Cosumnes River historically has been used as a water supply source for local agriculture and to meet municipal water supply demands. As part of the development of these water supply projects, a number of small check-dams have been constructed on the river. Several of these existing facilities represent potential impediments to the upstream migration of adult salmon and steelhead during the fall and winter, particularly during periods when instream flows are low. Fisheries investigations, conducted on the river over the past four decades provide information on the occurrence of salmon and steelhead within the river and can be used, in part, to serve as a technical foundation for identifying and evaluating potential management actions designed to improve conditions for anadromous fish on the river.

The Cosumnes River presently supports a variable run of fall-run Chinook salmon. California Department of Fish and Game (CDFandG) conducted annual spawning surveys from 1953 until 1989 resulting in estimates ranging from a low of zero to a high of 5000. The average number of adult Chinook salmon spawning in the river for these years was 1,300 fish. It has been estimated, however, that under proper conditions the Cosumnes River has the potential to support a run of over 17,000 spawning Chinook salmon (Miller, 1986). The Cosumnes River has historically also supported a steelhead run (CDFandG, Region 2, Cosumnes River files). No steelhead adults or juveniles were observed during limited observations in 1998, nor were any captured in 1996 in a beach seining study. Steelhead were observed by CDFandG biologists in the middle and lower reaches of the river in 1994. No estimate of reproductive success or juvenile production has been made on the Cosumnes River since no juvenile salmon outmigration surveys have been conducted. Juvenile salmon were caught using beach seines within the lower reaches of the river during studies supported by The Nature Conservancy both in 1996 and 1998.

---

[1]Funding for this investigation was provided by The Fishery Foundation and The Nature Conservancy

[2] Keith Whitener (B.S., Fisheries Biology, University of California, Davis, 1988)
P.O. Box 771, Walnut Grove, CA 95690

An assessment of the 1997-1998 Chinook salmon run was made using a combination of methods. An aerial redd survey was conducted by CDFandG. This survey estimated 209 total salmon redds, with 140 upstream of Granlees Dam and 69 downstream. The Nature Conservancy, supported by the Fisheries Foundation, conducted ground surveys that included redd and carcass counts below Granlees Dam as well as assessments of gravel conditions, fish passage barriers and general river conditions. The ground surveys identified 69 redds and 23 carcasses downstream of Granlees Dam. A conservative estimate of the 1997-1998 fall-run Chinook salmon spawning population is 300 to 500 fish.

As part of the 1997-98 fisheries surveys on the lower Cosumnes River, reconnaissance-level surveys were performed to identify and evaluate potential impediments to upstream and downstream migration of both salmon and steelhead. Fish passage barriers impose a number of limitations and problems for migrating salmon. Among the potential problems are blockage and/or delays in migration to suitable spawning areas, increased straying out of spawning areas, higher predation and poaching potential and overcrowding of existing areas below the barriers. Surveys were performed to identify fish passage impediments within a 34-mile reach of the lower Cosumnes River, extending from Granlees Dam downstream to the confluence with the Mokelumne River. Four fish passage barriers were identified (Figure 1). Salmonid barriers on the Cosumnes River include outdated fish ladders located at Granlees Dam, two summer dams and one low-flow road crossing.

Granlees Dam, built in 1921, is operated by Rancho Murrieta Community Services District as a diversion dam for local water supplies. It is located 1.6 miles above Highway 16 and 34.3 miles upstream of the confluence with the Mokelumne River. The summer dams are all located on private property at river miles (RM) 16.1 and 23.0. The low-flow road crossing is also located on private property at RM 6.7.

The objectives of this technical report are (1) to assess the barriers to salmonid migration on the lower Cosumnes River and determine if these barriers are an impediment for the upstream migration of Chinook salmon and steelhead; and (2) to make recommendations for the removal of passage barriers or modifications to fish barriers intended to improve access for Chinook salmon and steelhead to suitable spawning and juvenile rearing areas within the river. The assessment of existing barriers will provide a technical basis for developing plans to improve habitat conditions on the Cosumnes River, support project permitting and environmental documentation, and as a basis for identifying potential funding sources.

Environmental Baseline Conditions (existing)

Granlees Dam

Granlees Dam (RM 34.3; Figure 1) is a small diversion dam consisting of two separate barriers with an island separating them. Fish ladders exist on each of these barriers. Sketches of the fish ladders are presented in Figures 2A and 2B. Each barrier has a drop of eight to ten vertical feet. The fish ladders are of a step-and-pool design and are constructed of concrete. The left bank ladder consists of five step pools, each 3 feet wide with vertical drops ranging from 12 to 24

inches. Lengths of the pools range from 8 to 12 feet. Depths in the left bank ladder pools range from 19 to 41 inches. Photographs of the left bank ladder are presented in Figures 3A and 3B. The right bank ladder consists of six step pools, each 8 feet wide with vertical drops ranging from 12 to 32 inches. Lengths of the pools range from 10 to 30 feet. Depths in the right bank ladder range from 32 to 84 inches. Photographs of the right bank ladder are presented in Figures 4A and 4B. Standard criteria for step-and-pool fishways require pool dimensions to be 8 feet long, 6 feet wide and 4 feet deep (California Salmonid Stream Habitat Restoration Manual, 1994). Both ladders also contain large vertical drops into turning pools.

The Granlees Dam fish passages also have the following problems. The left bank barrier has two places where excess flow around the ladder could impede salmonids from locating the entrance to the ladder due to diminished attraction flows by comparison. Photographs of these locations are presented in Figures 5A and 5B. Neither ladder has debris deflectors at the upstream exit to the ladders. The resulting accumulation of debris and sediment have diminished the size of the step pools thereby creating depth and flow related passage problems. The bottom step pool on both ladders have a single entrance that may hinder the ability of salmonids to identify the opening under a full range of flows. The left bank ladder has outside walls that have collapsed to approximately the water level (Figure 3B).

The Granlees Dam fish ladders impose a number of passage problems. The inadequate size of the step pools creates ineffective resting areas. Flows outside of the fish ladder provide confusing attraction flows that can delay the identification of the mouth of the ladder. Build-up of debris and sediment can impede the progress of salmonids once in the passages. Inadequate entrance pools do not provide salmonids adequate access to the passages at all flow ranges. Vertical drops in excess of 12 inches create flow velocities that can impede salmonids. Inadequate wall height increases the risk of salmonids jumping out of the pools.

Summer Dams and Low-Flow Crossing

Summer dam 1 is located at river mile 23.0 (Figure 1). The dam consists of a concrete slab across the width of the channel. Photographs of summer dam 1 are presented in Figures 6A and 6B. During summer low-flows boards are put into existing notches located in the concrete slab to create a sufficient reservoir to allow ease of pumping. A concrete apron extends downstream 2 meters below the slab and ends at the top of a four-foot vertical plunge pool. Erosion underneath the concrete skirt has created an undercut bank. As a result, a severe back eddy occurs at the bottom of the plunge pool. Poured concrete and rubble extends 10 meters above and below the dam in an apparent attempt to control bank erosion. On the left bank, erosion has occurred around the concrete skirting allowing flow into the plunge pool. It should also be noted that this summer dam and the resulting plunge pool constitute a hazard for recreational users of the river. The dangers result from a narrow, condensed channel making an abrupt turn

approximately 25 meters above the plunge pool. The hydraulics of the pool adds to the potential hazardous nature of this site.

Summer dam 2 is located at river mile 16.1 (Figure 1). Photographs of summer dam 2 are

presented in Figures 7A and 7B. This dam consists of a concrete slab across the width of the channel, with a poured cement retaining wall on each side. Again, boards are put into existing notches to allow retainment of water behind the dam under low flow conditions. Riprap is located on each bank extending 2 to 3 meters downstream of the slab but does not extend across the width of the river. A 2.5-foot elevation drop occurs from the low point in the concrete slab to the water surface elevation below the dam.

Low-flow crossing 1 is located at river mile 6.7 (Figure 1). A photograph of the low-flow crossing is presented in Figure 8. The crossing is used by adjacent landowners to cross the river during low flow periods to access farmland on the south bank. This crossing consists of a concrete slab 4 meters wide with an apron extending 1 to 2 meters downstream. A 2.5-foot vertical drop occurs from the downstream edge of the slab to the water surface elevation downstream. An existing fish passage structure is located on this crossing and consists of a narrow concrete channel located in midstream extending from 3 meters below the concrete slab to the downstream edge of the slab. This structure is failing and does not meet current hydrological standards for fish passage.

The two summer dams and one low flow crossing all create fish passage problems at the critical low flow times. Fish passage at low flows is extremely important on the Cosumnes River, a river that in some years does not get optimum passage flows until after the spawning season.

Other Barriers

Additionally, two other permanent summer dam structures occur on the Cosumnes River. These dams are located at RM 13.0 and RM 24.3. Water surface elevation drops for each of these dams is approximately one foot and therefore deemed not a passage problem at this time.

Recommended Improvements

Potential modifications to fish passage facilities at the Granlees Dam, two summer dams, and the low-flow crossing were identified. Modification options were discussed during site visits with George Heise, P.E. (CDFandG Hydraulic Engineer) and Dr. Charles Hanson (fisheries consultant) during June 1998. Based on results of the site visits, and consideration of alternative methods for providing fish passage at each of the facilities, the following recommendations have been developed:

Modifications be made to both the existing fish ladders at the Granlees Dam in accordance with current CDFandG hydraulic criteria for fish passage. Additional modifications would include the installation of debris deflectors at each of the upstream ladder intakes, and that flow barrier walls and bank stabilization occur to restrict flows from bypassing the fish ladder and providing false attraction flows; and

Both the summer dams and the low-flow crossing should be modified, in accordance with standard CDFandG design criteria and protocol for low-elevation barriers, including

installation of standard rock weirs on the downstream side of each existing facility.

Monitoring Effectiveness

Post construction monitoring provides an important component in determining the success of the project. Monitoring should span several years to ensure the ability to determine if all potential salmonid barriers have been modified to allow proper adult migration. Monitoring and evaluation of the project should include the following: (1) verification and documentation of completed construction; (2) documentation of hydraulic conditions over a range of flows at construction sites; (3) comparison of measured conditions with fish passage criteria; (4) biological monitoring of upstream adult and downstream juvenile migration.

Anticipated Cost of Passage Facilities

Detailed engineering budget estimates have not been prepared for the proposed fish passage modifications. General construction costs for fish passage facilities are estimated to be approximately $10,000 per vertical foot.

Based upon the generalized cost criteria, it is estimated that construction costs for modification to the two fish ladders at Granlees Dam (approximately 10-foot vertical elevation each), would be approximately $200,000. The anticipated cost for modification of the summer dams would be approximately $40,000 each (assuming a 4-foot elevation change). The anticipated construction costs for fish passage at the low-flow road crossing is estimated to be approximately $20,000, based upon a 2-foot vertical rise in elevation.

Additional costs associated with developing engineering and construction plans, site surveys, channel stabilization (if required), difficulties associated with site access for construction, permitting and environmental documentation, and monitoring cannot be estimated without further investigation and development of passage facilities at each of the identified sites.

Schedule

All cooperating parties should implement the design process of this project as early as possible to allow for adequate review. Initiation of preliminary designing six months prior to the planned start of construction should allow for proper review and provide adequate time for the permitting of the final design. Design and review will take two to three months.

The process of permitting should begin with the initial implementation of the project and will continue through all phases of design. Permitting will take six months.

All construction occurring within the Cosumnes River should be planned in accordance with the summer low flows. This time period typically ranges from July 1 to October 15. Construction can be expected to last approximately one month.

Monitoring of salmonids in relationship to potential barriers should begin during the adult fall-run Chinook salmon migration. This migration is dependent upon flows in the river and can range from October until January. Monitoring should also include juvenile outmigration to determine spawning success and population estimates. Juvenile outmigration can begin as early as February and continue until June. Post project monitoring should occur for a minimum of two years to allow the proper evaluation of all modified barriers.

A Potential Timeline for the Modification of Salmonid Barriers on the Cosumnes River.

Task	Start Date	Time to Completion
Design and review	January 1, 1999	2-3 months
Permitting	January 1, 1999	6 months
Construction	August 15, 1999	1 month
Monitoring	October 15, 1999	2 years

Constraints on Implementation

All projects relating to the modification of existing fish barriers must get approval from private landowners. Permission to access all private land must be accompanied by written approval.

Rancho Murrieta Community Service District must approve all actions relating to the design, planning, permitting, and construction regarding modification of the fish barriers at Granlees Dam.

Required Permits

The following State and Federal permits would be required for the modification of existing fish barriers on the lower Cosumnes River.

Army Corps of Engineers Section 10/Section 404 permit or Letter of Permission (LOP);

Regional Water Quality Control Board Water Quality Certification or Waiver;

CEQA environmental documentation (NEPA compliance will also be required in the event of Federal funding);

California Department of Fish and Game Streambed Alteration Agreement;

Endangered Species Act (ESA) compliance; and

Historic Preservation Waiver

Potential Funding

The design and construction of fish passage facilities which will benefit salmon and steelhead populations within the Sacramento - San Joaquin rivers and Delta have been identified as high priority projects to receive State and/or Federal funding assistance. Funding assistance is available for these fish passage facilities through CALFED Bay-Delta Program, State Proposition 204, Federal Bay-Delta Act, and through the Central Valley Project Improvement Act (CVPIA). In addition, funding may be available through private sources and other Federal and State grants for watershed and fisheries habitat enhancement projects. Many of these funding programs, such as CALFED, typically provide funding up to 50% of the total project costs, including design, permitting, construction, and monitoring costs. Many of the funding sources require specific grant applications. CALFED is currently soliciting proposed projects in support of the Ecosystem Restoration Projects and Programs (proposals are due July 2, 1998 for current CALFED funding applications), with additional funding opportunities occurring in the future. The majority of funding applications strongly encourage cooperative partnerships among agencies and organizations soliciting funds for habitat improvement projects and encourage, but do not necessarily require, cost-sharing among a variety of sources. Private funding sources (e.g., Packard Foundation) are also available, and can be used to either meet full project costs or contribute to project cost-sharing with other funding entities.

Literature Cited

California Department of Fish and Game. 1994. California Salmonid Stream Habitat Restoration Manual.

California Department of Fish and Game. Cosumnes River Files. Region 2 Headquarters, Rancho Cordova.

Miller, K., 1986. Environmental overview of the proposed Cosumnes River Project. Master's thesis, California State University, Sacramento.

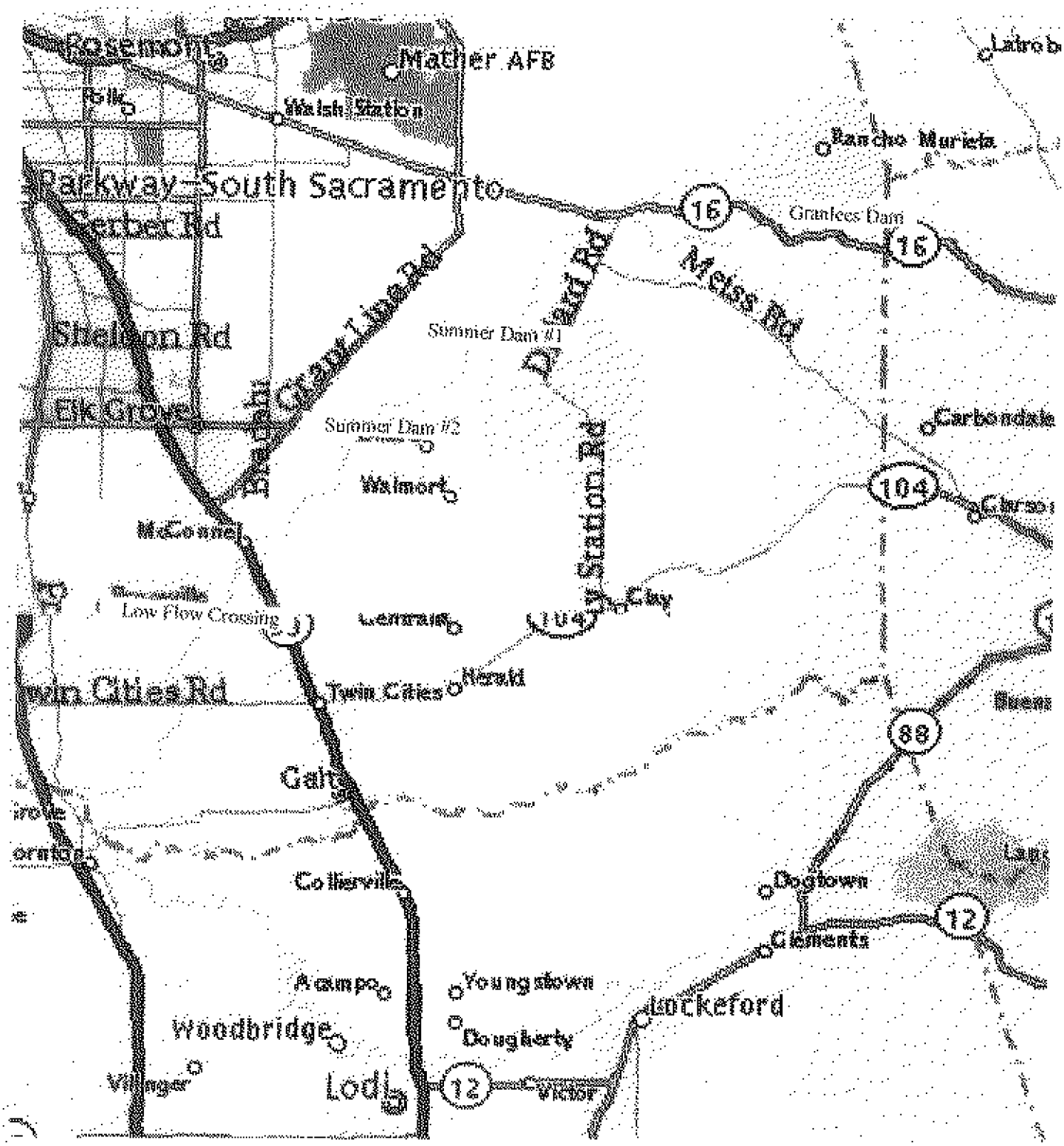

Figure 1. Approximate locations of known salmonid migration barriers on the Cosumnes River, Sacramento county, CA.

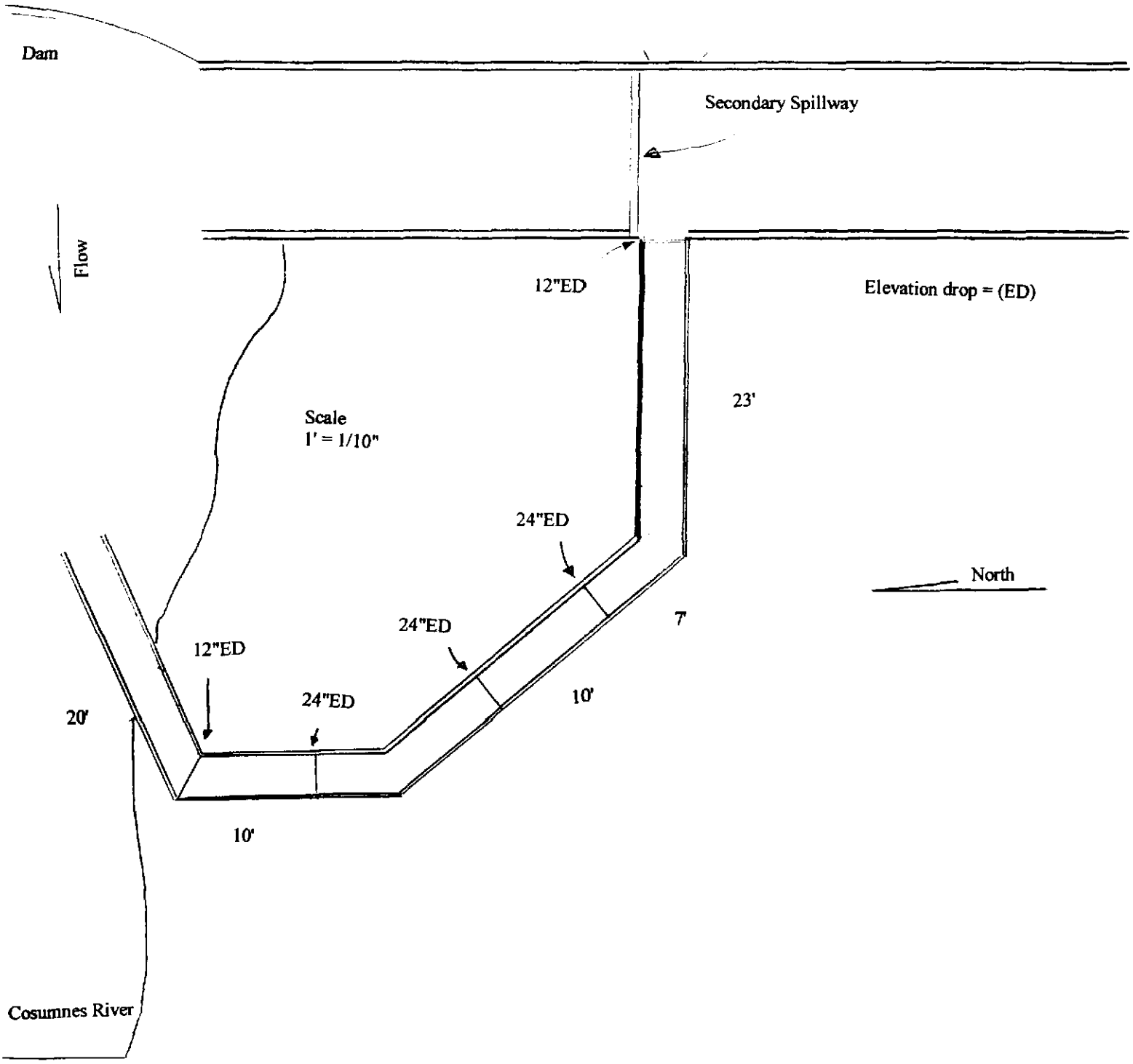

Figure 2a. Existing left bank fish ladder at Granlees Diversion Dam, Rancho Murrieta, CA. Ladder specifications do not meet current NMFS or CDFG hydraulic criteria. Note Excessive elevation drops, inadequate pool widths (w=3'), and small turning pools. Also not the proximity of the exit pool to spillway.

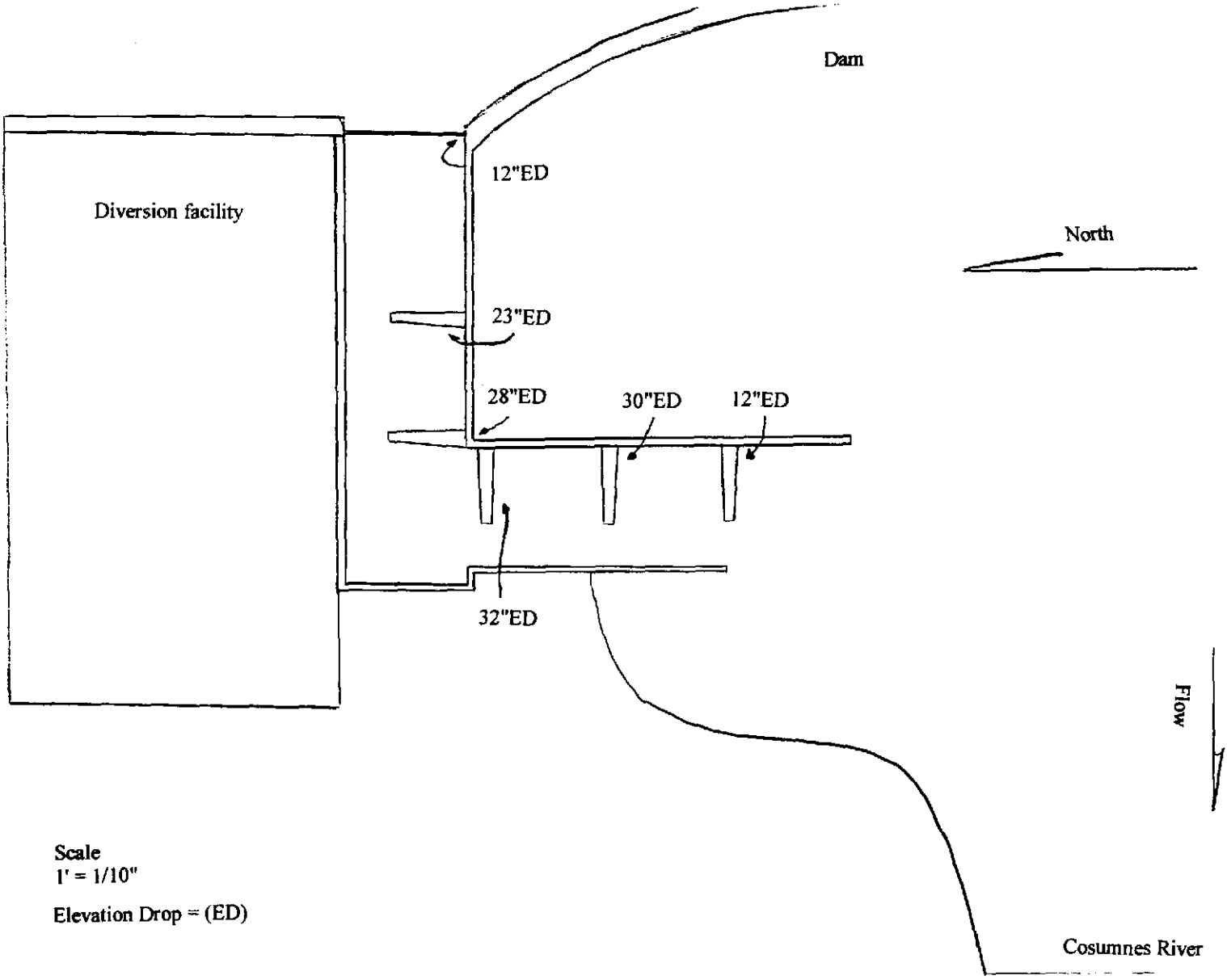

Figure 2b. Existing right bank fish ladder at Granlees Diversion Dam, Rancho Murrieta, CA. Ladder specifications do not meet current NMFS or CDFG hydraulic criteria. Note elevation drops up to three times the maximum suggested jump height of 12 inches. Also note the proximity of the exit pool to the diversion intake.

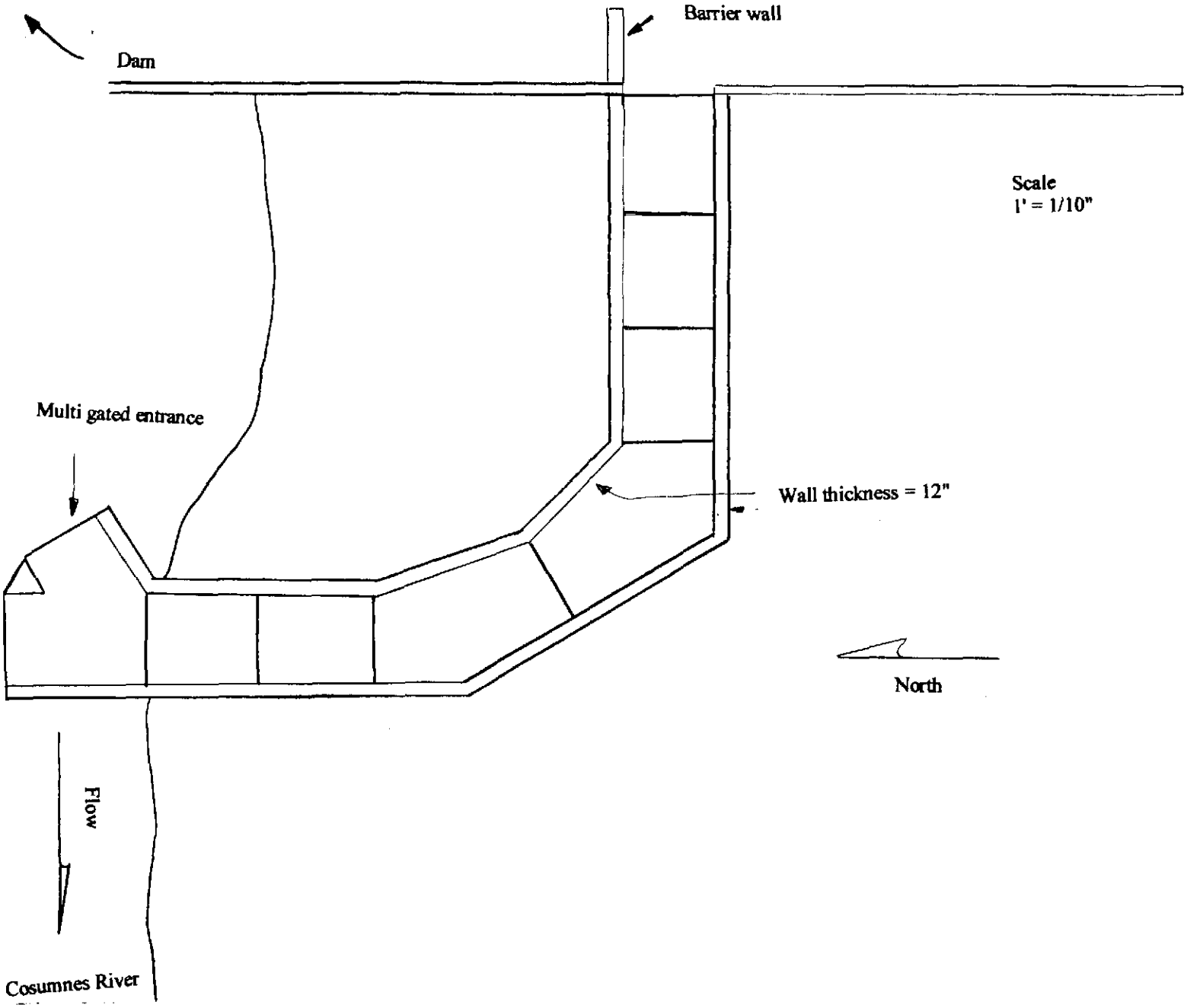

Figure 3a. Conceptual design of modified fish ladder at left bank Granlees Dam, Rancho Murrieta, CA. The new ladder meets or exceeds both NMFS and CDFG hydraulic criteria. Ladder will be lengthened to increase pool numbers and decrease elevation drops to 12 inches in each pool. Depths will be brought up to 4 feet throughout the length of the ladder, widths will be increased to 6 feet to increase volume, and walls will be significantly widened to increase durability throughout a wider range of flows. Note the barrier wall adjacent to the exit pool to prevent fish from spilling back into the basin below the dam upon exiting the ladder. Entrance pool will be outfitted with three entrances for use at different flows.

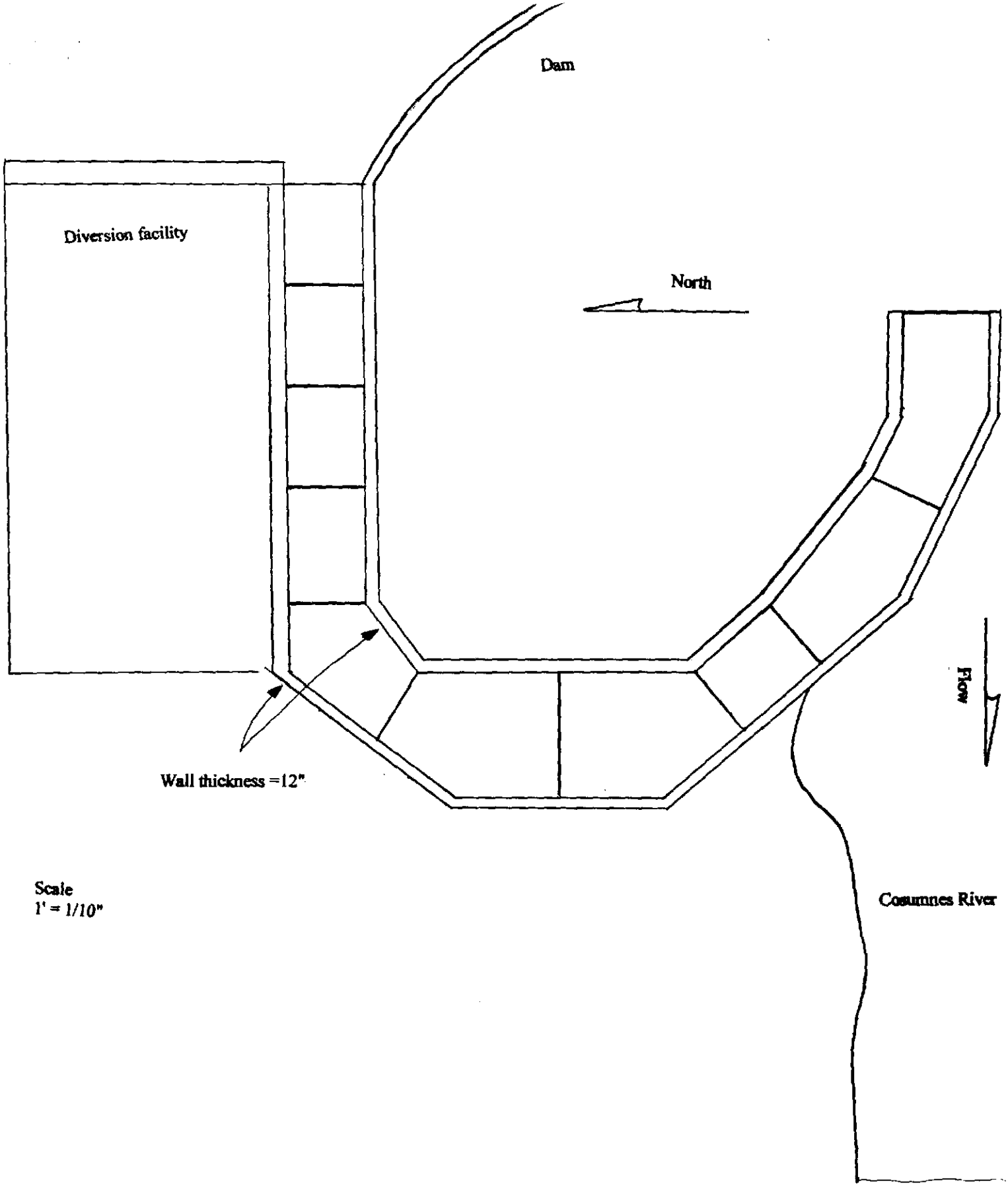

Figure 3b. Conceptual design of modified fish ladder at right bank Granlees Dam, Rancho Murrieta, CA. The number of pools has been increased from 5 to 10 to reduce jump height. New ladder meets or exceeds NMFS and CDFG hydraulic criteria. Elevation drops are less than or equal to 12".

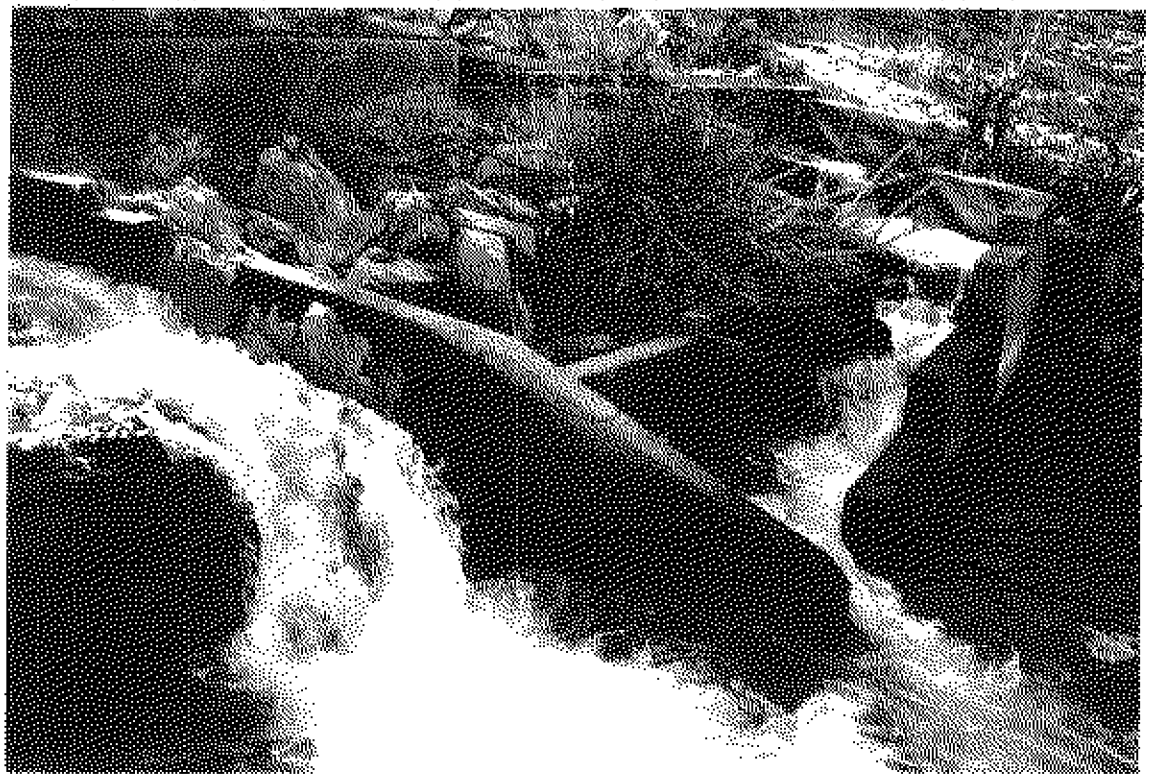

Figure 3A. Left bank fish ladder.

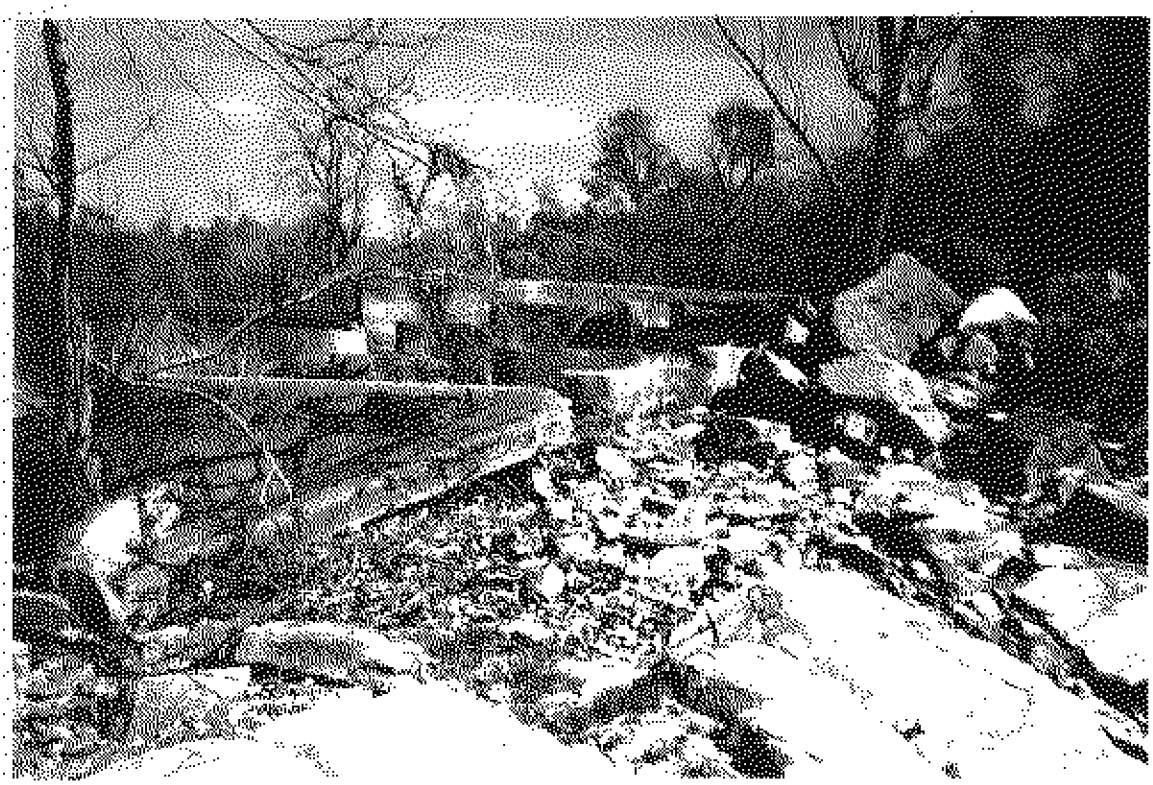

Figure 3B. Left bank fish ladder including collapsed walls.

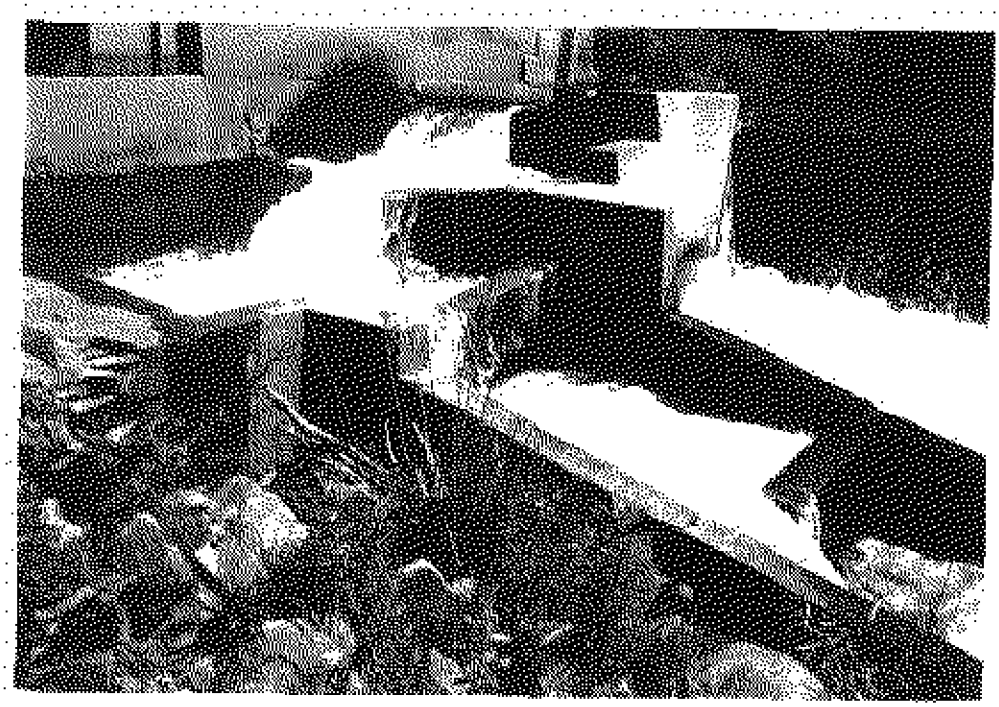

Figure 4A. Right bank fish ladder.

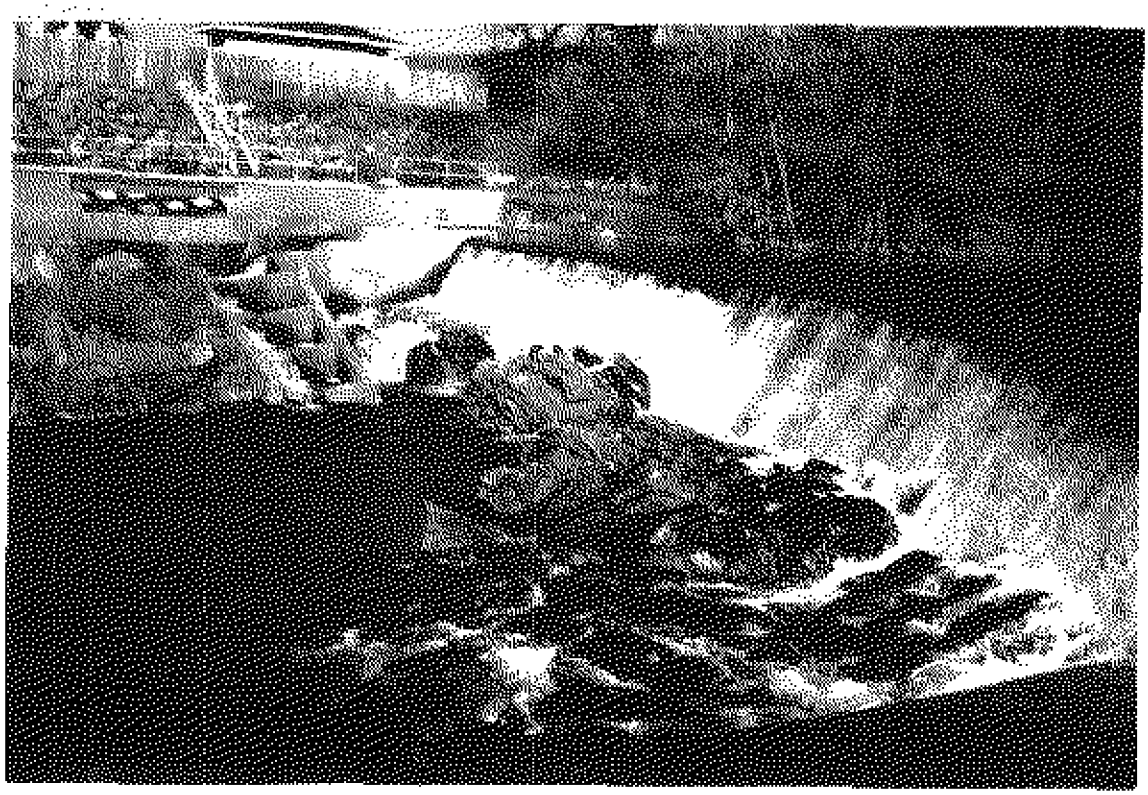

Figure 4B. Right bank dam and fish ladder.

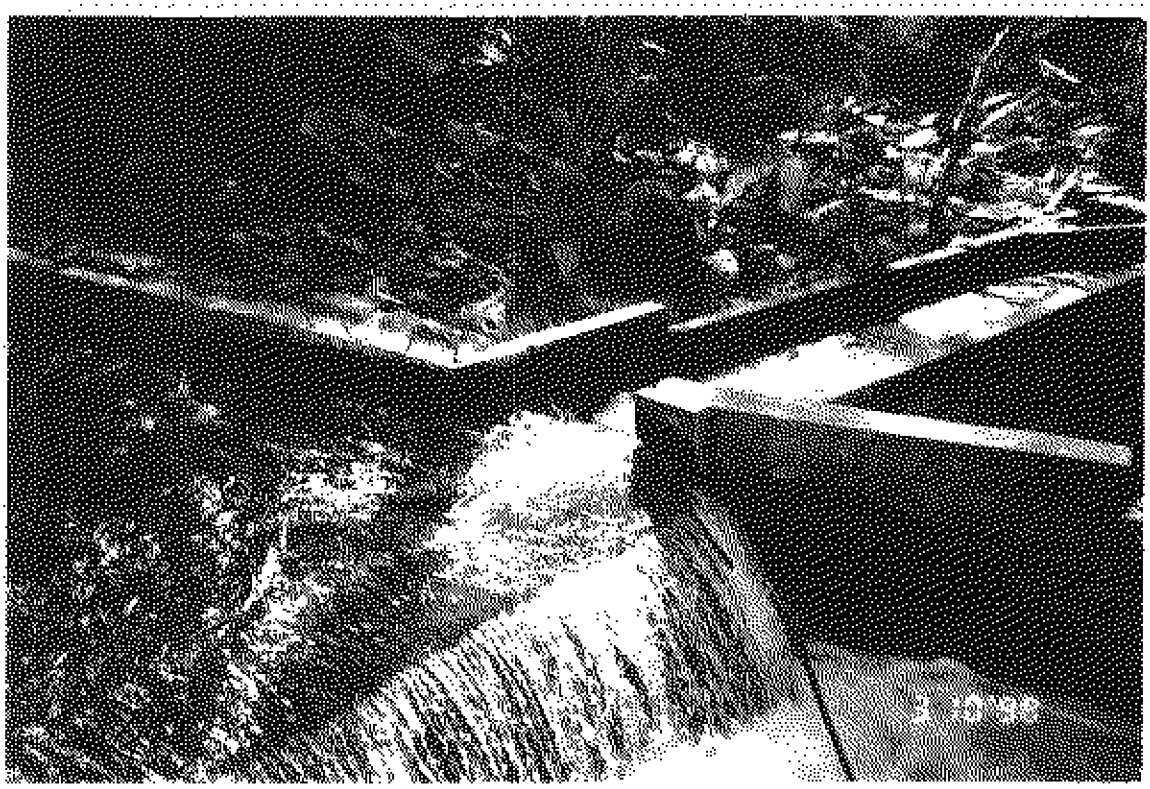

Figure 5A. Excess flow near left bank fish ladder.

Figure 5B. Excess flow around dam.

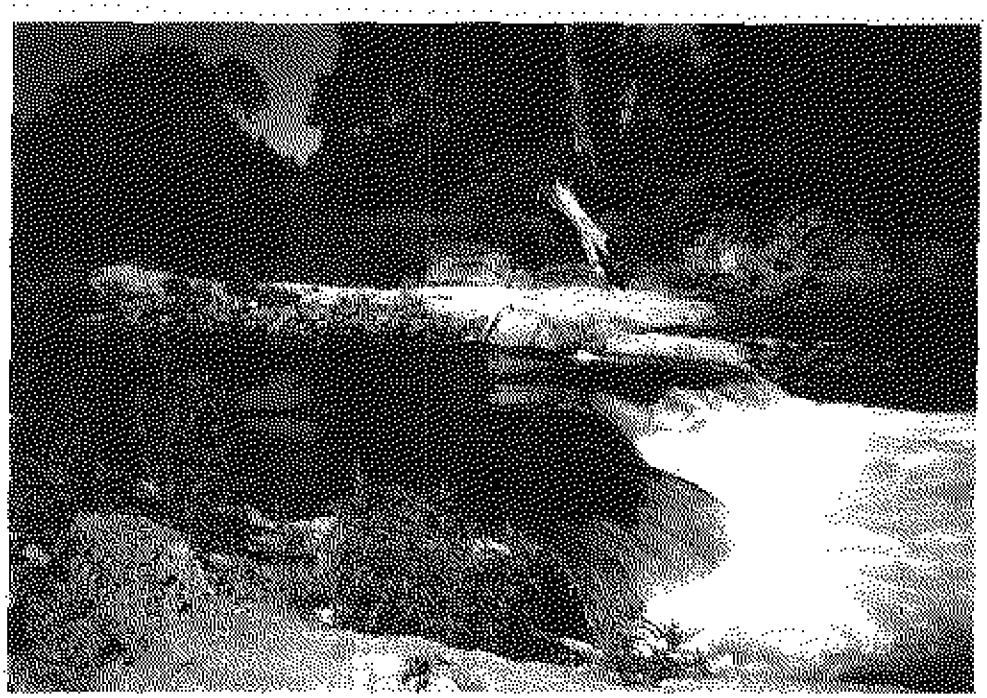

Figure 6A. Summer dam 1.

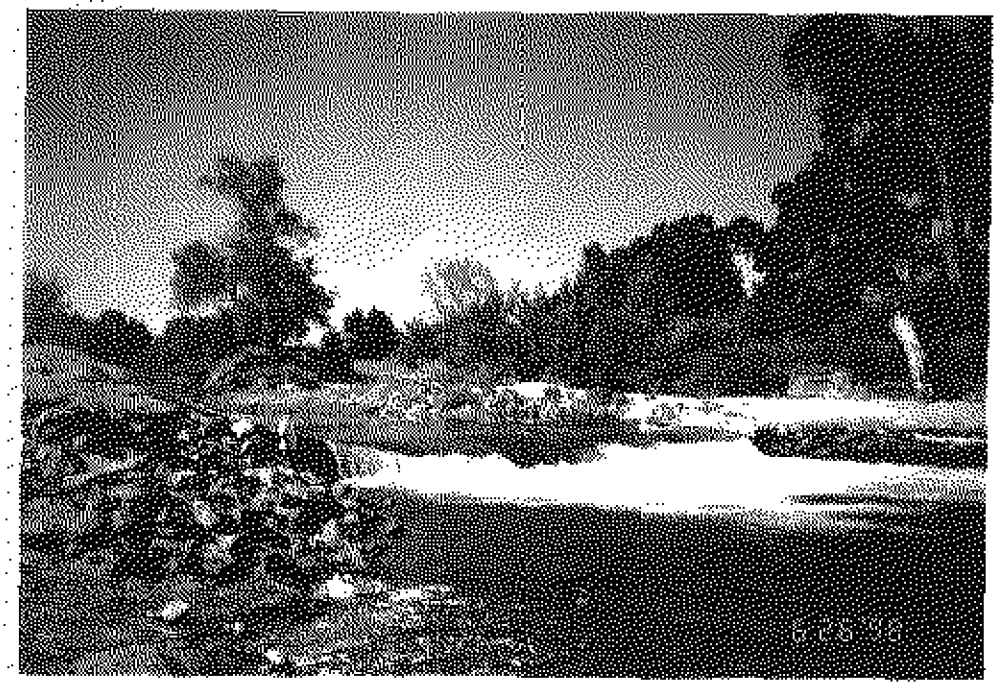

Figure 6B. Summer dam 1.

Figure 7A. Summer dam 2.

Figure 7B. Summer dam 2.

Figure 8. Low flow crossing.